It remained for an eastern State to report the greatest damage from a single hailstorm in 1929. This was a million-dollar loss at and near Hartford, Conn., on August 1, and the greater part of the damage was to greenhouses and the tobacco crop.

A hailstorm in Illinois on May 1 that extended from Cora to Raleigh caused a loss of $720,000. The hail was so severe that roofs were pierced, windows broken greenhouses practically demolished, and fruit ruined over a path 2 to 6 miles wide and 6 miles long. * * *

PRELIMINARY STATEMENT OF TORNADOES IN THE UNITED STATES DURING 1929

By Herbert C. Hunter

[Weather Bureau, Washington, January 30, 1930]

In advance of the final study of the 1929 windstorms which is expected to be finished during the coming summer, the following preliminary statement, compiled from the material thus far available from section directors and others, is presented:

TORNADOES AND PROBABLE TORNADOES

	January	February	March	April	May	June	July	August	September	October	November	December	Year
Number	5	5	17	60	37	11	6	4	7	2	0	4	158
Deaths	9	23	20	168	35	2	0	0	0	1	----	0	258
Damage [1]	10	160	352	4,824	1,408	733	32	151	2	4	----	6	7,682

TORNADIC WINDS AND POSSIBLE TORNADOES [2]

	January	February	March	April	May	June	July	August	September	October	November	December	Year
Number	1	0	4	5	3	2	2	0	0	3	0	0	20
Deaths	4	----	0	0	3	0	0	----	----	0	----	----	7
Damage [1]	1,250	----	20	20	50	2	([3])	----	----	5	----	----	1,347

[1] In thousands of dollars.   [2] Several of these, in the final study, will probably be classed as not tornadoes.   [3] No estimate of the damage was obtained for either.

CYCLE RECURRENCES WITH VARIABLE LENGTH OF BOTH PERIOD AND AMPLITUDE [1]

551.501

By Charles F. Marvin

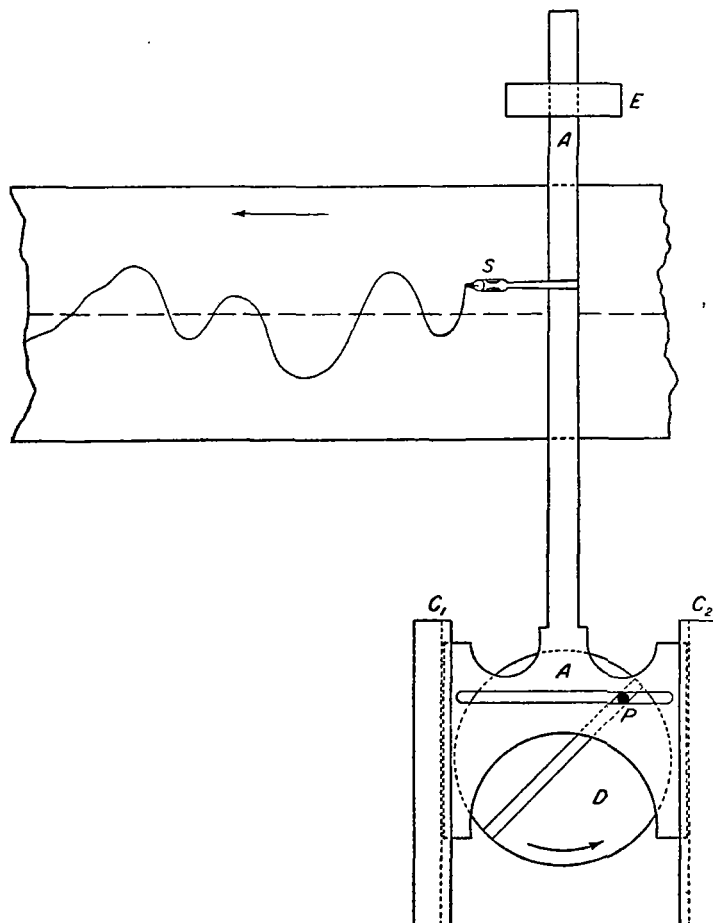[Weather Bureau, Washington, January 18, 1930]

FIGURE 1.—Harmonic analyzer

Following a bit further our interesting discussions of yesterday, concerning cycles and periodicities, I think I would like to state in writing briefly what I tried to make clear in our conversation regarding my conception of the geometrical background or basis for cycle recurrences with variable lengths of both period and amplitude. These conceptions have been in my mind for a great many years, in fact ever since our associate, Mr. Clough, began to advocate his theory of handling periodicities with various lengths and amplitudes.

I think that what I have to say can be made most clear by aid of the accompanying diagram (fig. 1), in which D is a disk revolving about its center, with a movable crank pin, P, which can be either fixed in any desirable position in the slot across the top of the disk, or it can have independent movement to or fro in the slot, either from the center outward in one direction, or from one side of the disk to the opposite, etc. The plate AA is carried between lateral guides, $C_1 C_2$ to the guide at E. This plate carries a stylus, S, for tracing movements of the plate. The crank pin, P, engages a slotted opening in the plate A, and, when the disk D is rotated, gives lineal harmonic motion to the plate A and the stylus S. If, now, a band of paper is moved continuously forward under the stylus S, a record is traced of the combined movements of the paper and of the stylus. When the crank pin retains a fixed position and D is revolved at a uniform rate we have uniform motion of a point in the circle which traces out the conventional trigonometric curve on the paper. It is obvious, however, that if the rotation of the disk D is not uniform but executed in an accelerated and decelerated manner the period of the harmonic curve traced out will be variable and not constant. It is equally obvious that if

[1] This paper was prepared in the form of a letter to Dr. A. E. Douglass, University of Tucson, Tucson, Ariz.